

SUBJECT INDEX

A

- A46 lethal trait
 - zinc deficiency and, 421
- Abetalipoproteinemia
 - vitamin E deficiency and, 371
- Acinar cells
 - exocrine pancreatic, 86-88, 96, 98
- Acinetobacter calcoaceticus*
 - pyroloquinoline quinone in, 303, 306-7, 310-11
- Acquired immune deficiency syndrome (AIDS)
 - anorexia in, 476, 488, 491
 - epidemiology of, 475-77
 - gastrointestinal tract in infections of, 480-85
 - symptoms relating to, 478-80
 - malnutrition in, 485-92
 - nutritional support and, 493-95
 - opportunistic infections in, 477, 480-82, 487, 489, 493
 - wasting syndrome in, 476-77, 485-95
 - zinc deficiency and, 427
- Acrodermatitis enteropathica
 - zinc metabolism abnormality and, 243, 426-27
- Actinomycin D
 - metallothionein induction and, 65
 - pancreatic gene expression inhibition and, 95-96
- Acyl CoA:cholesterol acyltransferase
 - n-3 fatty acids and, 158
- S-Adenosylmethionine decarboxylase
 - intestinal cell differentiation and, 198, 200
- Adrenalectomy
 - metallothionein levels and, 67-68
 - pancreatic adaptation to, 98-99
- Adrenal gland
 - vitamin E in, 370
 - zinc deficiency and, 420
- Adrenergic blockade
 - metallothionein synthesis and, 67-68

- Adriamycin
 - antioxidant role of metallothionein and, 77
- Adults
 - body composition of, 258-60
 - iron losses in, 136
 - osteoporosis in, 398-409
 - vitamin D deficiency in, 202
 - zinc deficiency in, 416, 426-27
- Aging
 - anorexia of, 388
 - calcium absorption and, 409
 - energy expenditure and, 255-56, 258-72
- AIDS
 - See Acquired immune deficiency syndrome
- Alcohol
 - osteoporosis and, 406, 408-9
- Alcoholism
 - zinc deficiency and, 416, 427
- Aldose reductase
 - in eye lens, 235
- Alkoxyl radical
 - activity of, 358
- Alopecia
 - zinc deficiency and, 425
- Alpha-fetoprotein
 - neural tube defects and, 282
- Amino acids
 - autoimmune disease and, 425
 - cancer and, 116-20, 127
 - cataract and, 238, 241-42, 249
 - cholecystokinin release and, 387
 - empirical modeling and, 51
 - kinetics of, 112-14, 121-26
 - metabolism of, 109-11, 127
 - selenium and, 453-65, 469
 - synthesis of, 13
 - in transgenic animals, 224-27
- Aminopterin
 - folic acid antagonists and, 10
- Amphetamines
 - conditioned taste aversion and, 386
- Amygdalin, see Vitamin B₁₇
- Amylase
 - genes, 94, 98
 - pancreatic, 85-86, 88-92, 94-100
- Anemia
 - iron deficiency, 134-36, 140-41

- metallothionein levels in, 79
- neural tube defects and, 283
- pernicious, 6-7
- Anencephalus
 - environmental factors and, 279-80
 - genetic factors and, 278
 - nutrition deficiency and, 287
- Angina pectoris
 - n-3 fatty acids and, 161
- Anorexia
 - gastrointestinal peptides and, 388, 392
 - nutritional status in AIDS and, 476, 488, 491
 - zinc deficiency and, 425
- Antacids
 - osteoporosis and, 403-4, 408
- Antifolate drugs
 - neural tube defects and, 281
- Antipernicious anemia factor of liver, 6-7
- Aphthous ulcers
 - nutritional status in AIDS and, 478-79
- Apoenzymes
 - quinoprotein dehydrogenase, 303, 307-11
- Apolipoproteins
 - in hepatocytes, 338-42, 344-51
 - n-3 fatty acids and, 157-58
 - plasma transfer of, 174, 181, 186
- AR 42J acinar cell line
 - pancreatic amylase mRNA levels in, 98
- Arachidonic acid
 - dietary sources of, 436
 - in skin, 438, 440-45
- Ascorbic acid
 - colorimetric redox-cycling assays and, 304
 - nonheme iron absorption and, 138
 - synthesizing ability, 12
 - see also Vitamin C
- Ash
 - in transgenic animals, 227
- Atherosclerosis
 - hypertriglyceridemia and, 182
 - n-3 fatty acids and, 151, 160
 - vitamin E and, 358
- Aureomycin
 - as feed additive, 8

- Autoimmune disease
 zinc deficiency and, 424, 425
- Azidothymidine (AZT)
 AIDS-related wasting syndrome and, 482, 492
- B**
- Bacteria
 AIDS and, 478-84, 489
 goiter endemias and, 28, 34-35
 pyrroloquinoline quinone in, 298, 309, 311-14
 selenoenzymes in, 462
- Barrier immunity
 zinc deficiency and, 417
- Basophils
 zinc deficiency and, 419
- B-complex vitamins
 discovery of, 4-7
- Beltville selection experiment
 nutrient partitioning and, 214
- Bile
 metallothionein in, 64, 71
- Bismuth
 metallothionein induction and, 65
- Black tongue
 as nutritional deficiency disease, 4-5
- Blood
 cells
 metallothionein in, 78-79
 model-based compartmental analysis and, 53
 pressure
 norepinephrine and, 269
 viscosity
 n-3 fatty acids and, 161
- Body
 composition
 aging and, 258-60, 269
 fat
 aging and, 258-59, 261-65, 267, 269-72
- Bombesin
 satiety and, 389, 391-92
- Bone
 cells
 vitamin D in, 202-8
 mass
 in osteoporosis, 397-404, 406-9
 matrix proteins
 synthesis of, 203-4
 metallothionein in, 64, 76
 mineral metabolism and, 398
- Brain
 metallothionein in, 64
 PUFAs in, 436
 satiety and, 384-88, 390, 392
- Brassica* spp.
 goitrin in, 26
- Bromosulphothalein
 folate-binding protein transport and, 327-28, 330
- Bulimia
 cholecystokinin and, 388
- Butter fat
 pancreatic adaptation to diet and, 93
- Butylated hydroxytoluene (BHT)
 antioxidant activity of, 360
- C**
- Cachexia
 amino acid concentrations in, 111-12, 116-17
 animal models of, 114-15, 126
 characterization of, 107-8
 clinical features of, 108-9
 controls in studies of, 115-16
 debilitating effects of, 126-27
 hepatic protein synthesis and, 122
 interorgan substrate metabolism in, 120
 3-methylhistidine studies and, 110-11, 120-21
 muscle protein catabolism in, 120-21
 nitrogen-balance studies and, 109-10
 patient selection in studies of, 116
 regional amino acids in
 balance of, 112, 117-20
 kinetic studies of, 113-14, 121-22
 whole-body amino acid
 kinetic studies and, 112-13, 122-26
- CaCo-2 enterocytes
 folate-binding proteins and, 321-22
 plasma lipid transfer activity and, 187
- Cadmium
 detoxification of, 64, 72
 metallothionein levels and, 65-67, 69, 79
- Caerulein
 pancreatic adaptation to diet and, 96-97
- Caffeine
 osteoporosis and, 408
- Calbindin-D
 intracellular calcium transport and, 196
- Calcium
 cataract and, 242-43
- empirical modeling and, 51
- neural tube defects and, 289, 292
- nonheme iron absorption and, 138
- osteoporosis and, 398-409
- plasma lipid transfer activity and, 174
- recommended daily allowance of, 399-400, 408-9
- toxicity, 403
- in transgenic animals, 227
- as water-borne goitrogen, 27-28
- Calcium-binding proteins
 crystallins and, 235
 vitamin D-dependent, 202
 vitamin-K dependent, 203
- Caloric restriction
 cataract and, 244-45
- Cancer
 amino acids in
 concentrations of, 116-20, 127
 kinetics of, 121-26
 cachexia in, 108-9, 114-17, 120-22, 126
 diethylstilbestrol and, 15
 quack remedies against, 15-16
- Candida* sp.
 gastrointestinal symptoms in
 AIDS and, 478, 480
- Candidiasis
 zinc deficiency and, 417, 424
- Capsaicin
 satiety and, 385
- Carbohydrate
 AIDS-related malabsorption of, 483-84, 488
 cataract and, 236-37
 cholecystokinin reduction of, 386
 disturbed metabolism of, 109
 folate-binding proteins and, 321
 hypertriglyceridemia and, 153
 lipoproteins and, 339, 347, 351
 neural tube defects and, 281
 pancreatic adaptation to diet and, 86, 89, 91-92, 96-100
 transgenic manipulations and, 221, 227
- Cardiovascular risk
 lipoprotein metabolism and, 337-38
 n-3 fatty acids and, 161, 163
- Carnitine palmitoyl transferase
 n-3 fatty acids and, 157
- Carotenoids
 antioxidant activity of, 360

- cataract and, 246-47, 249
- free radical detoxification and, 13
- neural tube defects and, 289
- Catalase
 - antioxidant activity of, 359
 - cataract and, 246
 - in eye lens, 235
- Cataract
 - animal studies of, 236-45
 - characterization of, 234
 - human studies of, 245-49
 - infantile, 237
 - pathogenesis of, 235-36
 - pyroloquinoline quinone and, 313
 - senile, 234, 236-47, 249
- Catecholamines
 - meal challenge and, 267
 - metallothionein synthesis and, 67
- CCRF-CEM T-cell derived leukemic cell line
 - folate-binding proteins and, 320, 327-28
- Cell-mediated immunity
 - zinc deficiency and, 418-19, 423
- Ceruloplasmin
 - antioxidant activity of, 359
- Cetoleic acid
 - in fish oil, 153
- Cheilorine
 - as goitrogen, 23-24
- Chicks
 - hepatocytes in, 341
 - vitamin D deficiency in, 197, 199, 201
- Children
 - neural tube defects in, 278, 281, 283-88
 - vitamin D deficiency in, 196, 202
 - vitamin E deficiency in, 371
 - zinc deficiency in, 426-27
- Chinese hamster ovary (CHO) cell line
 - metallothionein in, 69, 77
- Chlamydia trachomatis*
 - gastrointestinal symptoms in AIDS and, 480
- Chloroquine
 - metallothionein degradation by, 70
- Chlortetracycline
 - as feed additive, 8
- Cholecystokinin (CCK)
 - pancreatic adaptation to diet and, 86, 88, 94, 96-97, 100
 - satiety and, 385-89, 391-92
- Cholestatic liver disease
 - vitamin E deficiency and, 371
- Cholesterol
 - cardiovascular disease and, 337-38
 - empirical modeling and, 51
 - in hepatocytes, 343-44, 346-47, 350-51
 - n-3 fatty acids and, 150-51, 153-55, 159-60, 162-63
- Cholesteryl ester
 - transfer activity of, 169-89
- Choline
 - deficiency, 344, 352
 - perosis and, 5
- Chromium
 - cataract and, 244
- Chromosome 16
 - human metallothionein genes on, 66
- Chymotrypsin
 - pancreatic, 86, 88-89, 95
- Chymotrypsinogen
 - pancreatic, 88-91, 96-97
- Cigarette smoking
 - osteoporosis and, 409
- Ciglitazone
 - pancreatic adaptation to diet and, 98
- cis-acting regulatory elements
 - metallothionein gene expression and, 66
- Citric acid
 - nonheme iron absorption and, 138
- Clostridium difficile*
 - gastrointestinal symptoms in AIDS and, 478, 480
- Coal-derived pollutants
 - goiter endemias and, 28-33
- Cobalt
 - deficiency, 7
- Colipase
 - pancreatic, 89, 92, 94
- Colorimetric redox-cycling assay
 - pyroloquinoline quinone and, 304-5
- Comamonas testosteroni*
 - pyroloquinoline quinone in, 310, 312
- Competitive uptake method
 - vitamin E bioavailability studies and, 366-69, 373-77
- Complement DNA (cDNA)
 - folate-binding protein, 322, 326-27
 - glutathione peroxidase, 459
 - pancreatic enzyme, 95
- Concanavalin A (ConA)
 - zinc deficiency and, 420
- Conceptual models
 - compartmental, 47-48
- CONSAM computer programs
 - model-based compartmental analysis and, 52, 54-57
- Contraception
 - iron losses and, 136
- Copper
 - cataract and, 246, 248
 - deficiency, 74
 - detoxification of, 75
 - eukaryotic gene regulation and, 466
 - lipid peroxidation and, 77
 - metabolism, 74-75
 - metallothionein levels and, 64-67, 69-71, 72-74, 76
 - neural tube defects and, 288
 - toxicity, 78
- Corneal opacities
 - zinc deficiency and, 425
- Corn oil
 - pancreatic adaptation to diet and, 92
 - tocopherol-stripped, 367
- Coronary heart disease
 - hyperalphalipoproteinemia and, 179
 - n-3 fatty acids and, 149-51, 161
- Creationism
 - attack on science and, 18
- Cretinism
 - endemic goiter and, 21
- Crithidia fasciculata*
 - growth factor requirement of, 8
- Cruciferae
 - goitrogenic properties of, 25-26
- Cryptosporidium* sp.
 - gastrointestinal symptoms in AIDS and, 478-79, 480-83
- Crystallins
 - in mammalian lens, 234-36, 244
- Cyclic adenosine monophosphate (cAMP)
 - metallothionein synthesis and, 68
 - pancreatic adaptation to diet and, 88
- Cyclohexamide
 - metallothionein induction and, 65
- Cyclooxygenase pathway
 - PUFA metabolism and, 442, 444-45
- Cytochrome c
 - amino acid sequences of, 11
- Cytokines
 - metallothionein induction and, 68, 76

- nutritional status in AIDS
and, 481, 488-95
zinc deficiency and, 418,
421, 427
see also Interferon; In-
terleukins; Tumor ne-
crosis factor
- D**
- DDT**
defense of, 13-14
- Decarboxylases**
quinoprotein, 313
- Dehydrogenases**
quinoprotein, 298, 302-3,
305-12
- Delayed-type hypersensitivity**
zinc deficiency and, 421, 426
- Dermatitis**
B vitamin deficiency and, 4
zinc deficiency and, 425
- Desulfovibrio* spp.
[NiFeSe]hydrogenase in, 459
- Deterministic models**
in compartmental analysis,
42-43
- Dexamethasone**
amylase regulation and, 98
lipoproteins and, 344, 349-50
- Diabetes**
cataract and, 234, 237, 239,
248-49
neural tube defects and, 281
n-3 fatty acids and, 160
osteoporosis and, 408
pancreatic adaptation to diet
and, 97-98
zinc deficiency and, 416,
425, 427
- Diarrhea**
aureomycin and, 8
nutritional status in AIDS
and, 475-76, 478-85,
487, 495
- Diazoxide**
pancreatic adaptation to diet
and, 98
- Diet**
lipoprotein secretion and, 339
neural tube defects and, 283,
288-90
pancreatic adaptation to, 85-
86, 88-100
- Dietary fiber**
neural tube defects and, 289
nutritional support in AIDS
and, 493
osteoporosis and, 405-6, 408-
9
- Diethylstilbestrol (DES)**
in beef cattle, 14-15
- Difference equation models**
in compartmental analysis,
42, 55
- Differentiation**
of bone cells, 202-8
of intestinal cells, 197-202
- α -Difluoromethylornithine**
intestinal cell differentiation
and, 198, 200, 202
- Digestion**
model-based compartmental
analysis and, 44, 50
- Digestive enzymes**
pancreatic, 85-100
- Dihomogammalinoleic acid**
(DGLA)
in skin, 437, 441, 443-45,
447
- Distributed system models**
in compartmental analysis,
42
- Disulfides**
as goitrogens, 26, 30, 32-33
- DNA**
hydroxyl radical degradation
of, 77
neutral theory of molecular
evolution and, 11-12
zinc role in metabolism of,
76
- Docosahexaenoic acid (DHA)**
dietary sources of, 436
plasma lipoprotein levels and,
151, 153-58, 162-63
in skin, 447
- Down's syndrome**
zinc deficiency and, 425,
427
- Ductal cells**
exocrine pancreatic, 86
- Dynorphin**
feeding drive and, 384
- Dyslipoproteinemias**
LTP activity regulation and,
184-87
- Dyspepsia**
nutritional status in AIDS
and, 478-79
- Dysphagia**
nutritional status in AIDS
and, 478-79, 485
- E**
- Edema**
zinc deficiency and, 425
- Ehrlich ascites tumor cell line**
zinc transfer from metallothio-
nein in, 70, 76
- Eicosanoids**
dietary oils and, 443, 446
- Eicosapentaenoic acid (EPA)**
plasma lipoprotein levels and,
150-51, 153, 155-58,
160, 162-63
in skin, 436, 441, 445, 447
VLDL and, 345-46
- Eicosatetraenoic acid**
biosynthesis of, 443
- EL-4 tumor cell line**
zinc deficiency and, 421
- Elastase**
pancreatic, 88
- Elderly**
energy expenditure in, 256,
258-60, 262-72
osteoporosis in, 398, 404
- Empirical modeling**
in compartmental analysis,
43, 46, 48-57
- Encephalocele**
neural tube defects and, 277
- Endopeptidases**
pancreatic, 88
- Endothelial cells**
plasma lipid transfer activity
and, 182
- Energy**
gut peptides and metabolism
of, 391-92
protein deposition in transgen-
ic animals and, 227
- Entamoeba histolytica*
gastrointestinal symptoms in
AIDS and, 479-80, 483
- Enteropathy**
nutritional status in AIDS
and, 484-85
- Environmental factors**
in neural tube defects, 279-92
- Environmental movement**
public perception of science
influenced by, 14
- Eosinophils**
zinc deficiency and, 419
- Epidermis**
EFAs in, 436-38, 444-47
functions of, 433, 434
layers of, 434-35
plasma lipid transfer activity
and, 182
PUFAs in, 438, 440-43
vitamin E in, 369
- Epithelial tissues**
iron deficiency and, 142
- Erythrocytes**
folate-binding proteins and,
320
glutathione peroxidase in, 466
metallothionein in, 78-79
selenium in, 454
- Erythroid marrow**
iron depletion in, 134-35

- Escherichia coli*
goiter endemias and, 28-29
pyrroloquinoline quinone in,
298, 303, 307-8, 310-14
selenocysteine in, 459-461
- Essential fatty acids (EFAs)
deficiency of, 436, 438, 440-41
dietary sources of, 436
metabolism of, 437
structural forms of, 436
- Estrogens
heavy metal absorption and,
73
lipoproteins and, 350-51
metallothionein synthesis and,
67
osteoporosis and, 401-2, 408-9
- Evening primrose oil (EPO)
in skin, 440, 443
- Eye
lens anatomy and physiology
of, 234-35
- F
- Fasting
lipoproteins and, 347
- Fat
AIDS-related malabsorption
of, 483-84, 488-90, 493-94
cholecystokinin reduction of,
386
coronary heart disease and,
150
dietary deficiency of, 435
necessity of, 435-36
pancreatic adaptation to diet
and, 86, 89-100
vitamin E in, 369, 371
- Fatty acids
cytokine production modulation and, 495
lipoproteins and, 339, 344-47, 351
pancreatic adaptation to diet
and, 90, 99
- Feeding
cholecystokinin and, 388
gastrointestinal hormones and,
389
- Ferritin
absorption of, 137
assay of, 78
iron status assessment and,
134, 144
- Ferrous sulphate
iron fortification and, 142
- Fibrinogen
n-3 fatty acids and, 161
- Fish
n-3 fatty acids in, 150-51, 162
transgenic, 219
- Flavonoids
as goitrogens, 27, 31-32
- Fluoride
osteoporosis and, 406
- Folate
deficiency, 323-25
Folate-binding proteins
cytoplasmic, 320, 331
distribution of, 320-21, 326-27
function of, 326-27
high-affinity, 319-26, 328, 331
membrane-associated, 320, 325-31
membrane-bound, 320, 322-23, 331
in milk, 323-224
in serum, 324-25
soluble, 320-25
structural properties of, 321-23
transport of, 325-331
- Folic acid
AIDS-related malabsorption
of, 483-84
antagonists of, 9-10
discovery of, 6
folate-binding proteins and,
319, 331
neural tube defects and, 280-81, 283-92
- Food
faddism
prevalence of, 2
goitrogens in, 22-25, 32, 35
iron bioavailability and, 137-140
neural tube defects and, 281
pyrroloquinoline quinone in,
308-9, 314
thermic effect of, 256-57, 264-68, 271-72
 α -tocopherol in, 367
- Formate dehydrogenase
selenium metabolism and,
456, 459-60
- Fractures
osteoporotic, 399-404, 406-8
- Francisella tularensis*
zinc deficiency and, 417
- Free radicals
harmful effects of, 357
metallothionein as scavenger
of, 76-77
- Fructose
pancreatic adaptation to diet
and, 92
- Fucophloroethols
as goitrogens, 25
- Fusion genes
growth-related, 219-21
- G
- Gadoleic acid
in fish oil, 153
- Galactose
pancreatic adaptation to diet
and, 92
- β -Galactosidase
selenium metabolism and, 456
- Gammalinoleic acid (GLA)
in skin, 440, 443, 445, 447
- Gancyclovir
nutritional status in AIDS
and, 483, 493
- Gas chromatography-mass spectroscopy
tocopherol studies and, 362-64
- Gas-liquid chromatography
pyrroloquinoline quinone and,
304
- Gastric bypass
vitamin B₁₂ malabsorption
and, 287
- Gastrin-releasing peptide
satiety and, 389
- Gastrointestinal tract
nutritional status in AIDS
and, 477-85, 494
- Genes
apolipoprotein, 338, 345, 347
fusion, 219-21
glutathione peroxidase, 469
immunoregulatory, 423, 427
integrated, 220-24
iron-loading, 144
metallothionein, 66-69, 74-76, 219-23, 228
in neural tube defects, 278-79
pancreatic, 94-96, 98-100
pyrroloquinoline quinone synthesis and, 310-11
regulation of eukaryotic, 466
transfer of, 217-18, 220
zinc role in expression of, 76
- Giardia lamblia*
gastrointestinal symptoms in
AIDS and, 478-80, 483
- β -Globin
selenium metabolism and, 456
- Glucagon
lipoproteins and, 349
metallothionein levels and,
68-69, 76
pancreatic secretion of, 86-87
satiety and, 389, 390-92

- Glucocorticoids**
 amylase regulation and, 98-99
 lipoproteins and, 349-50
 metallothionein levels and, 67, 76
- Gluconeogenesis**
 in cancer cachexia, 109, 126
- Gluconobacter* spp.**
 pyrroloquinoline quinone in, 306
- Glucose**
 conditioned taste aversion and, 386
 pancreatic adaptation to diet and, 90, 92, 96, 98-100
- Glucose-6-phosphate dehydrogenase**
 cataract and, 248
- Glucosidases**
 intestinal, 89
- Glucosylorientin**
 as goitrogen, 25
- Glucosylvitexin**
 as goitrogen, 25
- Glutathione**
 in eye lens, 235
 as free radical scavenger, 77
- Glutathione peroxidase (GPX)**
 antioxidant activity of, 359
 cataract and, 246, 248
 gene, 469
 mRNA, 467-469
 nucleotide sequence of, 459
 selenium in, 452-54, 456-69
- Glutathione reductase**
 cataract and, 238
 in eye lens, 235
- C-Glycosylflavones**
 as goitrogens, 24-25, 27
- Goiter**
 endemic, 21-25, 27-29, 32-35
- Goitrin**
 as goitrogen, 23-24, 26
- Gold**
 metallothionein levels and, 65, 69
- Growth factors**
 discovery of, 7-8
 goiter and, 22
- Growth hormone (GH)**
 transgene manipulations and, 214, 216-18, 220-28
- Growth retardation**
 zinc deficiency and, 419
- Guinea pigs**
 vitamin E biokinetics in, 365-66
- H**
- Hammond model**
 of nutrient partitioning, 214-16
- Heart**
 attack
 HDL and, 338
 metallothionein synthesis in, 67
 vitamin E in, 365, 369
- Heavy metals**
 metallothionein role in detoxification of, 72
- HeLa cell line**
 folate-binding proteins and, 320
 metallothionein levels in, 66, 70
- Hemoglobin**
 in iron fortification programs, 143-144
 levels
 in iron deficiency, 135
 neutral theory of molecular evolution and, 11
- Hemosiderin**
 absorption of, 137
 iron status assessment and, 134
- Hep3B cell line**
 lipoprotein secretion in, 338
 plasma lipid transfer activity and, 187
- Hepatic triglyceride lipase**
 n-3 fatty acids and, 152-53
- Hepatocytes**
 lipoproteins in, 338-41, 343-44, 346-52
 metallothionein degradation in, 70-71
- Hepatoma-derived cell lines**
 metallothionein gene expression and, 67
- HepG2 cell line**
 lipoproteins in, 338, 340, 344-47, 350
 n-3 fatty acids in, 157
 plasma lipid transfer activity in, 182, 187, 189
- Hexanol extraction procedure**
 pyrroloquinoline quinone and, 306
- Hexokinase**
 in eye lens, 235-37
- High-carbohydrate diet**
 pancreatic adaptation to, 89, 91, 98-99
 transgenic manipulations and, 221
- High-density lipoprotein (HDL)**
 cardiovascular disease risk and, 338
 in hepatocytes, 339, 343
 n-3 fatty acids and, 152, 154-55, 159-60, 163
 plasma lipid transfer activity and, 174, 181-182
- vitamin E transport and, 369-72, 374-77**
- High-fat diet**
 pancreatic adaptation to, 89, 90, 92-93, 95-96, 98-99
- High-pressure liquid chromatography**
 pyrroloquinoline quinone and, 304
 tocopherol studies and, 362
- High-protein diet**
 pancreatic adaptation to, 89-90, 95
- HIV**
 See Human immunodeficiency virus
- HL-60 cell line**
 selenium repletion of, 466
- HMG-CoA reductase**
 n-3 fatty acids and, 158-59
 plasma lipid transfer activity and, 183
- Hormones**
 lipoproteins and, 339, 344, 348-49
 model-based compartmental analysis and, 53
 pancreatic, 86-87
 satiety and, 384-92
 zinc deficiency and, 420
- Human genome project**
 genetic diseases and, 18
- Human immunodeficiency virus (HIV)**
 alimentary tract and, 477, 484
- Humoral factors**
 satiety and, 384
- Humoral immunity**
 zinc deficiency and, 417
- Hydrazine method**
 pyrroloquinoline quinone and, 305-6
- Hydrocephalus**
 nutrient deficiency and, 283
- Hydroxyapatite crystals**
 in bone, 398
- 17-Hydroxydocosaheptaenoic acid (17-HDoHE)**
 physiological role of, 441, 447
- Hydroxyl radical**
 activity of, 358
- 13-Hydroxyoctadecenoic acid (13-HODE)**
 in epidermal water barrier system, 440
- Hyperalphalipoproteinemia**
 plasma lipid transfer activity and, 178-81
- Hypercholesterolemia**
 plasma lipid transfer activity and, 170, 182-85, 187

- Hyperlipidemia**
 alimentary, 188
 sympathetic nervous system activity and, 268
- Hyperparathyroidism**
 calcium deficiency and, 399, 403, 407-9
- Hyperproliferation**
 epidermal, 436
- Hypertension**
 fish oil and, 445
 n-3 fatty acids and, 161-63
 sympathetic nervous system activity and, 268
- Hyperthyroidism**
 endemic goiter and, 22
- Hypertriglyceridemia**
 in AIDS, 490
- Hyphomicrobium* spp.**
 pyrroloquinoline quinone in, 308
- Hypoglycemia**
 cataract and, 237, 242-43
- Hypothyroidism**
 endemic goiter and, 21-22, 25
 resorcinol-induced, 30-31
- I**
- Immune response**
 iron deficiency and, 142
 n-3 fatty acids and, 163
 nutritional deficiencies and, 415-16
 vitamin D deficiency and, 196-97
 zinc deficiency and, 416-27
- Immunoglobulins**
 zinc deficiency and, 417, 419, 422-24
- Immunological assay**
 of pyrroloquinoline quinone, 305
- Infants**
 folate-binding proteins in, 324, 331
 iron losses in, 135
 neural tube defects in, 283-84, 286-89, 291
- Infections**
 iron deficiency and, 142
 metallothionein induction and, 68-69, 76
 neural tube defects and, 280
 opportunistic
 nutritional status in AIDS and, 480-82, 487, 489, 493
 serum zinc levels in, 68-69
 vitamin D deficiency and, 196
- Inflammatory response**
 n-3 fatty acids and, 163
- PUFAs and, 443-45, 447
- Iniencephaly**
 neural tube defects and, 277
- Insulin**
 lipoproteins and, 344, 348-50
 pancreatic adaptation to diet and, 86-87, 96-100
 satiety and, 389-90
- Insulin-like growth factor-1 (IGF-1)**
 transgenic manipulations and, 216, 222, 224
- Interferon**
 metallothionein gene transcription and, 69
 zinc deficiency and, 418, 420-21, 426-27
 see also Cytokines
- Interleukins**
 metallothionein and, 68-69, 76
 see also Cytokines
- Intermediate density lipoprotein (IDL)**
 n-3 fatty acids and, 151-53
 plasma lipid transfer activity and, 177
- Intestine**
 calcium in, 399
 folate-binding proteins in, 324, 329-31
 iron absorption in, 140
 metallothionein in, 64, 72-73
 satiety and, 384, 390
 vitamin D in, 197-202
 vitamin E in, 366
- Iodide**
 as goitrogen, 24-25
- Iodine**
 deficiency, 21-22, 25, 29, 34-35
 excessive intake of, 25
 supplementation, 21-22, 34
- Iron**
 bioavailability of, 137-40
 deficiency, 74, 134-45, 140-42
 empirical modeling and, 51
 fortification, 142-44
 gene regulation and, 144, 466
 losses of, 135-36
 measurements of, 135
 metabolism, 78
 minimum daily requirement of, 135
 neural tube defects and, 292
 recommended daily allowance of, 136-37
 stores of, 134
 in transgenic animals, 228
- Ischemia-reperfusion injury**
 vitamin E and, 358
- Islets of Langerhans**
 hormone secretion and, 86
- Isopora belli***
 gastrointestinal symptoms in AIDS and, 478-83
- Isothiocyanates**
 as goitrogens, 23-26
- J**
- J774 macrophages**
 plasma lipid transfer activity and, 182
- K**
- Kallikrein**
 pancreatic, 88
- Kaposi's sarcoma**
 nutritional status in AIDS and, 485, 487
- KB human nasopharyngeal epidermoid carcinoma cell line**
 folate-binding proteins and, 320-22, 325
- Ketones**
 pancreatic adaptation to diet and, 96, 99-100
- Kidneys**
 metallothionein and, 64
 phosphorus in, 403
 selenium in, 463
 vitamin D in, 399, 409
 vitamin E in, 368
- Kinetic models**
 in nutrition research, 42-49, 51-57
- Klebsiella pneumoniae***
 goiter endemias and, 30
- L**
- L210 leukemic cell line**
 folate-binding proteins and, 325, 327-28
- L-364,718**
 cholecystokinin receptors and, 387
- Lactobacillus casei***
 as assay organism for riboflavin, 6
- Lactose**
 pancreatic adaptation to diet and, 92
- Laetrile**
 See Vitamin B₁₇
- Laminaria* spp.**
 goiter and, 25
- Lard**
 pancreatic adaptation to diet and, 92-93

- Lean tissue growth
genetic capacity for, 214
- Lecithin:cholesterol acyltransferase
n-3 fatty acids and, 159-60
plasma lipid transfer activity and, 171-72, 174-75, 180, 185-86
- Leucocytes
metallothionein in, 79
- Leucovorin
rescue, 10
- Leukemia
aminopterin and, 10
folate-binding proteins and, 324
- Leukopenia
zinc deficiency and, 419
- Life expectancy
rise in US, 14
- Lilium* spp.
pyrroloquinoline quinone and, 312
- Linamarin
goiter and, 24
- Linear systems
in model-based compartmental analysis, 45-46
- Linoleic acid
coronary heart disease and, 150
oxidative desaturation of, 439
in skin, 438, 440-41, 443
structure of, 437
VLDL and, 344
- Linolenic acid
in plants, 161-62
structure of, 437
VLDL and, 344
- Lipase
genes, 94
n-3 fatty acids and, 156
pancreatic, 85-86, 88-90, 92-96, 99-100
- Lipid peroxidation
metallothionein and, 77
vitamin E and, 358-61
- Lipid transfer protein (LTP)
in assays, 172-74
cholesterol flux and, 159-60
cholesteryl ester metabolism and, 177-78
HDL and, 181-82
hyperalphalipoproteinemia and, 178-81
inhibition of, 188-89
LDL density shifts and, 176-77
lipoprotein composition and, 175-76
purification of, 170-71
regulation of, 182-88
- Lipoprotein-deficient-plasma
LTP activity regulation and, 184-85, 189
- Lipoprotein lipase
n-3 fatty acids and, 152-53
- Lipoproteins
assembly of, 339-43
composition of, 175-76
kinetics of, 57, 339-40
metabolism of, 337, 338
model-based compartmental analysis and, 53
plasma lipid transfer activity and, 170-75, 177-82
regulation of secretion of, 343-51
vitamin E transport in, 369-77
- Liposomes
oxidation of, 361
- Lipoxygenase pathways
PUFA metabolism and, 442-44
- Lithium
as goitrogen, 28-29
- Litorin
satiety and, 389
- Liver
antipernicious anemia factor in, 6-7
copper in, 74-75
folate-binding proteins in, 330
lipoproteins in, 338, 341-42, 345-49, 351
metallothionein levels in, 64, 67-71, 74-78
n-3 fatty acid metabolism in, 156-58
protein synthesis disturbed in, 109, 122
PUFAs in, 436
selenium in, 454, 462-63, 466-469
vitamin D metabolism in, 195
vitamin E in, 364-65, 368-69, 371, 373-77
zinc in, 74-75
- Longevity
hyperalphalipoproteinemia and, 179
- Lorazepam
conditioned taste aversion and, 386
- Low-density lipoprotein (LDL)
in cardiovascular disease, 337-38
in hepatocytes, 345-46
n-3 fatty acids and, 151-55, 158-60, 163
plasma lipid transfer activity and, 173, 176-77
vitamin E transport and, 369-70, 372, 374, 377
- Low-fat diet
pancreatic adaptation to, 92-93
- Lupus
fish oil and, 445
- Lymphocytes
zinc deficiency and, 417-21, 424-25
- Lysophospholipids
secretion of, 352
- M
- MA104 monkey kidney epithelial cell line
folate-binding proteins and, 320, 322, 325
- Macrophage-derived-heat-stable protein factor
metallothionein induction and, 68
- Macrophages
plasma lipid transfer activity and, 182, 187
zinc deficiency and, 418, 421
- Magnesium
absorption
phytate impairment of, 405
as water-borne goitrogen, 28
- Malabsorption syndrome
nutritional status in AIDS and, 483-85
- Manganese
plasma lipid transfer activity and, 174
- Mast cells
zinc deficiency and, 419
- Mathematical models
compartmental, 47-48
- MDL-72527
intestinal cell differentiation and, 200, 202
- Meat
PUFAs in, 436
- Megavitamins
AIDS and, 495
- Memory
cholecystokinin and, 388
- Menke's disease
copper efflux in, 74
- Menopause
osteoporosis and, 401-9
- Menstruation
iron losses in, 136
- 6-Mercaptopurine
fetal zinc deficiency and, 423
- Mercury
metallothionein induction and, 65
- Messenger RNA (mRNA)
apoprotein, 159, 348-51

- cholesteryl ester transfer protein, 183
- glutathione peroxidase, 459-60, 467-69
- growth hormone gene, 220
- interleukin-6, 492
- lipid transfer protein, 188
- metallothionein, 65, 67-68, 73-74, 466
- pancreatic enzyme, 86-87, 90, 94-100
- Metabolism
 - amino acid, 109-14, 121, 127
 - carbohydrate, 109
 - EFA, 437-38
 - inborn errors of, 18
 - lipoprotein, 337-38
 - protein, 109-11
 - selenium, 452, 454-55
- Metallothionein
 - as acute-phase protein, 76
 - assays of, 78-79
 - characterization of, 64
 - copper levels and, 72-75
 - degradation of, 69-71
 - as free radical scavenger, 77
 - genes, 66-69, 74-76, 219-23, 228
 - heavy metal detoxification and, 72
 - as metal transfer protein, 76
 - occurrence of, 63-64
 - physicochemical properties of, 64-65
 - synthesis of, 65-68, 73, 75, 79
 - zinc levels and, 72-75
- Methionine-choline deficiency
 - zinc and, 423
- Methotrexate
 - folate-binding proteins and, 320, 325-28, 330-31
 - in leucovorin rescue, 10
- 3-Methylhistidine studies
 - in metabolic evaluation, 110-11, 120-21
- Methylobacterium organophilum*
 - pyrroloquinoline quinone biosynthesis in, 310
- Mice
 - cancer cachexia models in, 114
 - cataract in, 245
 - cytokine-induced anorexia in, 491
 - neural tube defects in, 282
 - pyrroloquinoline quinone in, 312, 314
 - satiety in, 386-87
 - transgenic, 217-21
 - zinc deficiency in, 419-25
- Michaelis-Menten kinetics
 - nonlinear behavior and, 45
- Microsporidium* sp.
 - gastrointestinal symptoms in AIDS and, 478-79, 481-82
- Milk
 - folate-binding proteins in, 320-21, 323-24, 331
 - as goitrogen, 23-24
- Millet
 - as goitrogen, 24-25
- Mimosine
 - as goitrogen, 27
- Minerals
 - as goitrogenic factors, 28
 - model-based compartmental analysis and, 53
 - nutritional status in AIDS and, 492
 - in transgenic animals, 227-28
- Mitochondrial capsule protein
 - selenium metabolism and, 464-65
- 77-kD Mitochondrial selenium-binding protein
 - selenium metabolism and, 456, 465
- Model-based compartmental analysis
 - in nutrition research, 42-57
- Molt 4F cell line
 - folate-binding proteins and, 320
- Monkeys
 - satiety in, 384
 - vitamin E bioavailability studies in, 375-76
 - zinc deficiency in, 423
- Motilin
 - satiety and, 389-90
- Mucosal immunity
 - zinc deficiency and, 417
- Multiple sclerosis
 - fish oil and, 445
- Muscle
 - proteins
 - selenium metabolism and, 456
 - vitamin E in, 365, 368
- Mycobacterium avium-intracellulare*
 - gastrointestinal symptoms in AIDS and, 479-81, 483-84
- Mycoplasma* spp.
 - infections
 - aureomycin and, 8
- Myristic acid
 - VLDL and, 344
- N
 - NaFeEDTA
 - iron fortification and, 143-44
 - Natural killer (NK) cells
 - zinc deficiency and, 418-19, 421, 426
 - Necator americanus*
 - iron loss and, 136
 - Neisseria gonorrhoea*
 - gastrointestinal symptoms in AIDS and, 478, 480
 - Neural tube defects
 - in animals, 283
 - characterization of, 277-78
 - dietary intake studies and, 288-89
 - environmental factors in, 279-92
 - genetic factors in, 278-79
 - intervention studies and, 289-92
 - nutritional status and, 282-88
 - Neurological function
 - iron deficiency and, 141
 - vitamin E and, 365-66, 371-72, 377
 - Neuropeptide Y
 - feeding drive and, 384
 - Neutral theory
 - of molecular evolution, 11-12
 - Neutrophils
 - zinc deficiency and, 418, 421, 424
 - Niacin, see Vitamin B₃
 - Niacinamide, see Vitamin B₃
 - Nicotinamide
 - black tongue disease and, 5
 - see also Vitamin B₃
 - Nicotinic acid
 - black tongue disease and, 5
 - see also Vitamin B₃
 - [NiFeSe]hydrogenase
 - selenium metabolism and, 456, 459
 - Nitrogen-balance studies
 - in metabolic evaluation, 109-10
 - Nocardia* spp.
 - pyrroloquinoline quinone in, 306
 - Noncompartmental analysis
 - in nutrition research, 43, 49
 - Non-Hodgkin's lymphoma
 - nutritional status in AIDS and, 485
 - Nonlinear systems
 - in model-based compartmental analysis, 45
 - Norepinephrine
 - feeding drive and, 384
 - kinetics of, 268-71

- weight loss and, 392
 NPLC cell line
 lipoprotein secretion in, 338
 Nutrient metabolism
 model-based compartmental
 analysis and, 44, 53
 Nutrient partitioning
 theory of, 214-17
- O**
- Obesity
 diabetes and, 249
 Odynophagia
 nutritional status in AIDS
 and, 478-79
 Oleic acid
 absorption of, 155
 in epidermal water barrier
 system, 440
 pancreatic adaptation to diet
 and, 93, 99
 structure of, 437
 VLDL and, 344-45
 Organic food
 as nutritional deception, 17
 Organochlorines
 as goitrogens, 30
 Ornithine decarboxylase
 intestinal cell differentiation
 and, 198-201
 Osteoblasts
 vitamin D and, 203-4, 208
 Osteoclasts
 vitamin D and, 205-8
 Osteomalacia
 vitamin D deficiency and,
 202-3, 404
 Osteoporosis
 animal studies of, 406-7
 bone metabolism and, 398
 characterization of, 397-98
 dietary factors and, 398-406,
 409
 fracture and, 399-402
 mineral metabolism and, 398
 nondietary factors and, 407-8
 physical activity and, 407-8
 risk and protective factors for,
 408
 Oxygen
 free radicals and, 358-60
 Oxytetracycline
 as feed additive, 9
- P**
- Palmitic acid
 pancreatic adaptation to diet
 and, 93
 VLDL and, 344-45
 Pancreas
 endocrine, 86-87
 exocrine
 dietary adaptations in, 85-
 100
 gene expression in, 94-96,
 98-100
 metallothionein and, 64
 Pancreatic polypeptide
 secretion of, 86
 Pangamic acid
 See Vitamin B₁₅
 Pantothenic acid
 See Vitamin B₅
 Parathyroid hormone
 calcium levels and, 399, 402
 Pellagra
 B vitamin deficiency and, 4
 nicotinic acid and, 5
 Penicillin
 as feed additive, 9
Pennisetum americanum (L.)
 as goitrogen, 24-25
 Pentane
 vitamin E and, 360
 Peptide YY
 weight loss and, 392
 Peripheral satiety system
 central feeding drive and,
 383-84
 Perosis
 choline and, 5
 Peroxyl radical
 lipid peroxidation and, 358-61
 Phenolics
 as goitrogens, 30-32
 Phenylalanine
 in regional amino acid
 metabolism, 114
 Phloroglucinol
 as goitrogen, 25, 27-31
 Phospholipid hydroperoxide glu-
 tathione peroxidase (GPX
 II)
 selenium dependency and,
 461-62
 Phospholipids
 in hepatocytes, 338-44, 350,
 352
 Phospholipid transfer protein
 characterization of, 171
 Phosphorus
 absorption
 phytate impairment of, 405
 autoimmune disease and, 425
 in bone, 398
 nonheme iron absorption and,
 138
 in osteoporosis, 403-4
 recommended daily allowance
 of, 403
 in transgenic animals, 227
 Phthalate
 folate-binding protein trans-
 port and, 327
 as goitrogen, 30, 32
 Physical activity
 aging and, 260-64, 266-70
 iron deficiency and, 141
 osteoporosis and, 407-8
 Phytates
 mineral absorption impairment
 and, 405
 nonheme iron absorption and,
 138
 Plants
 n-3 fatty acids in, 161-62
 Plasma
 free amino acid levels in,
 111-12
 LTP activity regulation and,
 185-87
 metallothionein in, 64, 71-72,
 78
 vitamin E in, 364-68
 Plasma glutathione peroxidase
 (GPX-P)
 selenium dependency and,
 462
 130-kD Plasma selenium-binding
 protein
 selenium metabolism and,
 456, 465
 57-kD Plasma selenoprotein P
 selenium metabolism and,
 464
Pneumocystis carinii pneumonia
 nutritional status in AIDS
 and, 487-88
 Point mutations
 metallothionein gene, 66
 Pokeweed mitogen (PWN)
 zinc deficiency and, 420
 Polyamines
 intestinal cell differentiation
 and, 198-202
 Polycyclic aromatic hydrocar-
 bons
 as goitrogens, 28, 30, 33
 Polyhydroxyphenols
 as goitrogens, 24-25, 27, 30
 Polyphenols
 nonheme iron absorption and,
 138
 Polyunsaturated fatty acids
 (PUFAs)
 in skin, 438, 440-47
 structural forms of, 436
 Potassium
 nutritional status in AIDS
 and, 487, 493-94
 Potatoes
 neural tube defects and, 281
 Pregnancy
 diethylstilbestrol and, 15
 folate-binding proteins and,
 324
 iron losses in, 136

- neural tube defects and, 278, 280-82, 284-91
- pyrroloquinoline quinone and, 313
- zinc deficiency and, 416, 422-23
- Proelastase
 - pancreatic, 95
- Progesterone
 - metallothionein synthesis and, 67
- Prostaglandins
 - in cyclooxygenase pathway, 442, 444-45
- Protease
 - genes, 94
 - inhibitor
 - metallothionein degradation and, 70
 - pancreatic, 85, 88, 90-91, 94-95, 97, 100
- Protein
 - AIDS-related malabsorption of, 488
 - autoimmune disease and, 425
 - cataract and, 248
 - meal challenge and, 265-66
 - metabolism of, 109-11
 - osteoporosis and, 404-5, 408-9
 - pancreatic adaptation to diet and, 86, 89-91, 94-97, 100
- Protein-calorie malnutrition
 - AIDS and, 485-92
 - cancer cachexia and, 108
 - endemic goiter and, 34-35
 - zinc deficiency and, 423, 426-27
- Protein kinase C
 - zinc deficiency and, 421, 427
- Protoporphyrin
 - in red blood cells, 135
- Pseudomonas* spp.
 - pyrroloquinoline quinone in, 306, 311
- Psoriasis
 - methotrexate against, 10
- Puromycin
 - metallothionein induction and, 65
- Pyridines
 - as goitrogens, 27, 30
- Pyridoxal
 - neural tube defects and, 283
- Pyridoxal phosphate
 - pyrroloquinoline quinone and, 314
- Pyrodoxine
 - See Vitamin B₆
- Pyrroloquinoline quinone
 - absorption spectra of, 300
 - analogues of, 310
 - assays of, 303-5
 - bacterial production of, 309
 - binding sites of, 301
 - biosynthesis of, 310-11, 315
 - chemical synthesis of, 309
 - chromatographic assessment of, 304
 - identification and determination of, 303-6
 - occurrence of, 306-9
 - physiological effects of, 311-13
 - properties of, 298-303
 - structure of, 299
- Qu
 - Quinoproteins
 - pyrroloquinoline quinone and, 299-314
- R
 - Rabbits
 - folate-binding proteins in, 330
 - plasma lipid transfer activity in, 182-84, 187-88
 - Radiation
 - cataract and, 236, 248
 - Raman spectroscopy
 - of pyrroloquinoline quinone, 306
 - Rats
 - cancer cachexia models in, 114-15
 - cataract in, 238-39, 244
 - folate-binding proteins in, 322, 324, 326, 330
 - hepatocytes in, 339-41, 343-44, 346-50, 352
 - hydrocephalus in, 283
 - iron in, 466
 - pyrroloquinoline quinone in, 313
 - satiety in, 384
 - selenium in, 463-69
 - transgenic, 217
 - vitamin D deficiency in, 197, 199
 - vitamin E studies in, 364, 366-67, 369
 - zinc deficiency in, 416, 419, 421
 - Recommended Daily Allowance (RDA)
 - of calcium, 399, 400, 403
 - of iron, 136-37
 - of micronutrients
 - in AIDS patients, 493
 - of phosphorus, 403
 - of vitamins, 17
- Red blood cells
 - folate estimations and, 285-86, 288
 - model-based compartmental analysis and, 53
 - selenium in, 454
 - vitamin E in, 364-66, 368-69
 - zinc deficiency and, 423
- Regional amino acids
 - balance of, 112
 - kinetic studies of, 113-14, 121-22
- Renal disease
 - n-3 fatty acids and, 160
 - zinc deficiency and, 416, 425, 427
- Repartitioning strategies
 - nutrients and, 214
- Reproductive organs
 - metallothionein and, 64
- Resorcinol
 - as goitrogen, 23, 30-31
- Resting metabolic rate
 - aging and, 256-64, 272
- Reticulocytes
 - metallothionein in, 78-79
- Retinene, see Vitamin A
- Retinol
 - empirical modeling and, 51
 - tracer kinetics and, 49
- Rheumatoid arthritis
 - fish oil and, 445
 - methotrexate and, 10
- Riboflavin
 - See Vitamin B₂
- Rickets
 - Vitamin D deficiency and, 196, 202
- RPMT 1788 human B cell line
 - metallothionein synthesis induction in, 68
- S
 - SAAM computer programs
 - model-based compartmental analysis and, 52-56
 - Safflower oil
 - pancreatic adaptation to diet and, 93
 - PUFAs in, 440
 - Saline
 - conditioned taste aversion and, 386
 - Salmonella* sp.
 - gastrointestinal symptoms in AIDS and, 478-81, 483
 - Satielin
 - food intake and, 389, 391
 - Satiety factors
 - circulating, 384

- Saturated fats
pancreatic adaptation to diet and, 93
- SDS/PAGE analysis
mammalian selenoproteins and, 463-64
- Seaweeds
as goitrogens, 24-25
- Secretin
pancreatic adaptation to diet and, 99-100
- Selenide
as selenium precursor, 461
- Selenium
amino acids and, 453-54
cataract and, 243-44, 246
deficiency, 8, 452, 462-69
in glutathione peroxidase, 452-54, 456-57, 459-60, 462-69
inorganic, 454
metabolism of, 452, 454-55
nomenclature for selenoproteins of, 455-57
selenide as precursor of, 461
tRNA and, 453-57, 459-61
14-kD Selenium-fatty acid-binding protein (FABP)
selenium metabolism and, 465
- Selenocysteine
in glutathione peroxidase, 453-58, 460-61
serine as precursor of, 458
UGA codon specification of, 458-59
- Selenomethionine
selenium metabolism and, 453-56
- Selenoprotein-P
selenium metabolism and, 456
- Serum
folate-binding proteins in, 320, 324-25, 331
- Sesame oil
conditioned taste aversion and, 386
- Shale-derived pollutants
goiter endemias and, 29-33
- Sheep
transgenic, 219-21
- Shigella* sp.
gastrointestinal symptoms in AIDS and, 478-81, 483
- Sickle cell anemia
zinc deficiency and, 416, 427
- Signal peptide recognition particle
pancreatic, 87
- Skin
See Epidermis
- Slim disease
See Acquired immune deficiency syndrome
- Small intestine
folate-binding proteins in, 324, 329-30
- Sodium
empirical modeling and, 51
- Sodium valproate
neural tube defects and, 281
- Somatomedins
activity of, 216
- Somatostatin
pancreatic secretion of, 86
satiety and, 389, 391
- Soybean oil
vitamin E in, 366, 376
- Spermidine/spermine-N-acetyltransferase
intestinal cell differentiation and, 199-201
- 17-kD Sperm selenoprotein
selenium metabolism and, 464-65
- Spina bifida
environmental factors and, 279-80
genetic factors and, 278
- Spinal cord
vitamin E in, 364-65, 368-69
- Spleen
metallothionein synthesis in, 67
vitamin E in, 364-65
- Staphylococcus* spp.
nicotinic acid as growth factor for, 5
- Starch
pancreatic adaptation to diet and, 90, 92, 98
- Steady state systems
in compartmental analysis, 44-47
- Stearic acid
structure of, 437
VLDL and, 345
- Stochastic models
in compartmental analysis, 42-43
- Streptococcus faecalis*
growth factor requirement of, 8
- Streptomycin
growth promotion and, 8
- Streptothricin
growth depression and, 8
- Stress
metallothionein induction and, 64, 67-68, 76, 78
zinc deficiency and, 76
- Stroke
HDL and, 338
- Strongyloides stercoralis*
gastrointestinal symptoms in AIDS and, 478-79, 484
- Subtilisin
metallothionein degradation and, 70
- Sucrose
lipoproteins and, 347-48
pancreatic adaptation to diet and, 92
- Sulfanilamide
folic acid synthesis in bacteria blocked by, 9
- Sulfurated organics
as goitrogens, 25-26, 30
- Sulpiride
transgenic manipulations and, 221
- Sunflower oil
pancreatic adaptation to diet and, 93
- Superoxide anion
free radical activity and, 358
- Superoxide dismutase
cataract and, 246
in eye lens, 235
- Superrat approach
in compartmental analysis, 48
- Swine
transgenic, 214-28
- Sympathetic nervous system
energy expenditure in aging and, 256, 266, 268-72
- T
- Tartrate resistant, acid phosphatase (TRACP)
in mouse marrow cultures, 205-7
- Tea
neural tube defects and, 281
- Testes
metallothionein genes in, 67
vitamin E in, 365, 369
- Tetracyclines
as feed additives, 8-9
- Tetrahymena geleii*
growth factor requirement of, 7
- Thermogenesis
aging and, 265-66, 268
- Thiamine
See Vitamin B₁
- Thiamine pyrophosphate
folate-binding protein transport and, 327-28
- Thiazide
osteoporosis and, 408
- Thiobacillus versutus*
pyrroloquinoline quinone in, 302-3
- Thiocyanate
as goitrogen, 24-25, 30-31
- Thioglycosides
as goitrogens, 26

- Thiolase**
 selenium metabolism and, 456
Thiooxazolidone
 as goitrogen, 23-26
Thrombogenesis
 n-3 fatty acids and, 161, 163
Thymulin
 zinc deficiency and, 427
Thymus
 metallothionein in, 64, 76
Thyroglobulin
 goiter and, 23
Thyroid cancer
 endemic goiter and, 22
Thyroid hormones
 empirical modeling and, 51
 lipoproteins and, 350
 meal challenge in elderly men and, 267
 vitamin D similarity to, 196
Thyroiditis
 autoimmune
 endemic goiter and, 22
Thyroid peroxidase
 inhibition of, 25, 27, 31-33
Thyroid-stimulating hormone (TSH)
 goiter and, 22, 32
Thyrotropin
 goiter and, 22
Thyrotropin-releasing hormone (TRH)
 satiety and, 389
 transgenic manipulations and, 221
Thyroxine
 goiter and, 23, 32
TMT-081-MS rat mammary tumor cell line
 selenocysteine in, 461
 α -Tocopherol
 antioxidant activity of, 358-361, 377
 bioavailability of, 362, 366-69, 373-77
 cataract and, 239
 kinetics of, 361-62, 364-77
 lipoprotein transport of, 370-77
 radiolabeled, 361, 366
 see also Vitamin E
Total body potassium counting
 in AIDS, 493-94
 fat-free weight assessment and, 258, 260
Total parenteral nutrition
 zinc deficiency and, 426
Toxins
 neural tube defects and, 281-82
- Tracer kinetics**
 in compartmental analysis, 53-56
 in nutrition research, 42-47, 49-50, 52
trans-acting factors
 metallothionein gene expression and, 66
Trans-epidermal water loss
 in human skin, 438
Transferrin
 iron status assessment and, 134-35
 in transgenic animals, 228
Transfer RNA (tRNA)
 selenoamino acid, 453-61
Transgenic manipulations
 nutrient requirements and, 213-16, 224-28
 procedures for, 217-18, 220-24
Translocon membrane pore
 pancreatic enzymes and, 87
Transthyretin
 empirical modeling and, 51
Triglyceride
 n-3 fatty acids and, 151-53, 155-59, 162
 pancreatic adaptation to diet and, 89-90, 92-94, 96
 plasma transfer of, 170-71, 175-77, 181-85, 187-89
Triiodothyronine
 goiter and, 23
Trinitrophenylated polysaccharide (TNP-LPS)
 zinc deficiency and, 420
Trypanosoma brucei
 gastrointestinal symptoms in AIDS and, 484
***Trypanosoma* spp.**
 zinc deficiency and, 417, 421
Trypsin
 pancreatic, 88-89, 91, 96-97
Trypsinogen
 pancreatic, 89-91, 95-97
Tumor burden
 in cancer cachexia studies, 115
Tumor necrosis factor (TNF)
 metallothionein induction and, 76
 see also Cytokines
Turnover studies
 compartmental analysis and, 44, 47, 49, 51
Twenty-four hour energy expenditure
 aging and, 256-57
Two-compartment model
 in nutrition research, 47
- U**
UGA codon
 in selenocysteine specification, 458-59
Unsaturated fats
 pancreatic adaptation to diet and, 93
Unsaturated fatty acids (UFAs)
 structural forms of, 436
Uremia
 zinc deficiency and, 427
Urine
 metallothionein in, 64, 78
- V**
Vagus nerve
 satiety and, 385, 388-90
Vegetable oil
 plasma cholesterol level and, 154
Vegetarian diet
 cataract and, 238
 osteoporosis risk and, 404
Very low density lipoprotein (VLDL)
 in hepatocytes, 338-40, 342-43, 345, 347-51
 n-3 fatty acids and, 151-53, 155, 157-59
 vitamin E transport and, 370-77
Vibrio parahaemolyticus
 gastrointestinal symptoms in AIDS and, 480
Vinegar
 pyrroloquinoline quinone in, 313-14
Vitamin A
 cataract and, 246-47
 chemical identification of, 7
 as chylomicron component, 49
 neural tube defects and, 281-82
 synthesizing ability, 13
 transport of, 435
 vitamin D similarity to, 196
Vitamin B₁
 AIDS-related malabsorption of, 483
 cataract and, 246-48
Vitamin B₂
 assay for, 6
 cataract and, 237-38, 245-46, 249
 colorimetric redox-cycling assays and, 304
 deficiency, 4
 neural tube defects and, 283
 protein binding of, 321

- yellow tinge in egg whites induced by, 3
 vitamin D and, 196, 202-3
- Vitamin B₃
 discovery of, 5
 see also Nicotinamide;
 Nicotinic acid
- Vitamin B₅
 discovery of, 5-6
 neural tube defects and, 283
- Vitamin B₆
 cataract and, 246-48
 deficiency, 423
 discovery of, 4-5
- Vitamin B₁₂
 AIDS-related malabsorption of, 483-84
 deficiency, 423
 discovery of, 7
 hydrocephalus and, 283, 287
 synthesizing ability, 13
- Vitamin B₁₅
 against cancer, 16
- Vitamin B₁₇
 as quack remedy against cancer, 15-16
- Vitamin C
 cataract and, 240-41, 246-49
 claims for, 16-17
 neural tube defects and, 281, 283, 287, 289
 synthesizing ability, 12
 vitamin E regeneration and, 360, 366
 see also Ascorbic acid
- Vitamin D
 bone cell differentiation and, 202-8
 calcium absorption and, 399, 402-4, 408-9
 cataract and, 246
 characterization of, 195-96
 chemical identification of, 7
 cytokine regulation and, 495
 deficiency, 196-97, 199, 201-2, 205
 intestinal cell differentiation and, 197, 199-202
 metabolism, 195
 sources of, 12
- synthesis of, 434
 in transgenic animals, 228
- Vitamin E
 cataract and, 238-40, 244, 246-49
 chemical identification of, 7
 deficiency, 360, 365-67, 371-73, 375, 377
 deuterated, 362-68, 371-77
 as free radical scavenger, 77
 ischemia-reperfusion injury and, 358
 lipoprotein transport of, 369
 neural tube defects and, 283, 287
 see also α -Tocopherol
- Vitamin K
 calcium-binding proteins and, 203
 chemical identification of, 7
- Vitamins
 megadoses of, 17
 model-based compartmental analysis and, 53
 nutritional status in AIDS and, 492
 sparing effect on requirement for, 9
 synthesizing ability for, 12-13
 in transgenic animals, 227
- Vitexin
 as goitrogen, 25
- W
- Wasting syndrome
 nutritional status in AIDS and, 476-77, 485-95
- Water
 goitrogens in, 27-35
 model-based compartmental analysis and, 53
 skin permeability to, 436
 trans-epidermal loss of, 438
- Weight
 fat-free, 256, 258-67, 270-71
 loss
 in cancer cachexia, 108
 gastrointestinal peptides and, 392
- nutritional status in AIDS and, 475-76, 482, 487-88, 491
- zinc deficiency and, 419
- White blood cells
 metallothionein in, 79
- Whole-body amino acid kinetic studies
 in metabolic evaluation, 112-13, 122-26
- Whole-body models
 in compartmental analysis, 53, 56
- Work performance
 iron deficiency and, 141
- X
- Xylitol preload
 satiety and, 384
- Y
- Yeast proteins
 selenium metabolism and, 456
- Yersinia enterocolitica*
 goiter endemias and, 29
- Z
- Zinc
 absorption
 phytate impairment of, 405
 AIDS-related malabsorption of, 483-84
 animal studies and, 419-25
 cataract and, 243, 246, 248
 deficiency, 72-76, 78, 416-27
 gene expression and, 76, 423, 427, 466
 immune system and, 416-27
 infections and, 68-69
 lipid peroxidation and, 77
 metabolism, 56, 74-76, 78
 metallothionein levels and, 64-67, 69-74, 76, 79
 neural tube defects and, 282-83, 287-88
 tracer kinetics and, 53
 in transgenic animals, 227-28

